

WHAT IS CLAIMED IS:

1. An image input system, comprising:

a measuring unit for measuring an object and for generating shape data of the object;

a calculating unit for calculating coordinate transformation information based upon a plurality of shape data obtained from a plurality of surface regions of the object as the object rotates about an axis of rotation, said coordinate transformation information including a position of the axis of rotation; and

a processing unit for synthesizing at least some of the plurality of shape data in accordance with the calculated coordinate transformation information.

2. An image input system, comprising:

a measuring unit for measuring an object and for generating shape data of the object;

a calculating unit for calculating coordinate transformation information based upon a plurality of shape data obtained from a plurality of surface regions of the object as the object rotates about an axis of rotation, said coordinate transformation information including an angle of rotation of the object about the axis of rotation;

a processing unit for synthesizing at least some of the plurality of shape data in accordance with the calculated coordinate transformation information.

3. The image input system according to claim 2, wherein
said coordinate transformation information further includes a position
of the axis of rotation.

4. An image input system, comprising:

a measuring unit for measuring an object and for generating shape data of the object, the measuring unit being positionable in different positions relative to an axis of rotation;

a calculating unit for calculating coordinate transformation information based upon a plurality of shape data obtained from different points of view of the object obtained by the measuring unit positioned at multiple positions, said coordinate transformation information including a position of the axis of rotation; and

a processing unit for synthesizing at least some of the plurality of shape data in accordance with the calculated coordinate transformation information.

5. An image input system, comprising:

a measuring unit for measuring an object and for generating shape data of the object, the measuring unit being positionable in different positions relative to an axis of rotation;

a calculating unit for calculating coordinate transformation information based upon a plurality of shape data obtained from different points of view of the object obtained by the measuring unit positioned at multiple positions, said coordinate transformation information including an angle of rotation of the measuring unit around the axis of rotation; and

a processing unit for synthesizing at least some of the plurality of shape data in accordance with the calculated coordinate transformation information.

6. The image input system according to claim 5, wherein

said coordinate transformation information further includes a position of the axis of rotation.

7. A camera system, comprising:

a taking unit comprising an image pick-up apparatus, said image pick-up apparatus being configured to rotate about a prescribed axis of rotation and being configured to pick up images as the image pick-up apparatus is rotated about the prescribed axis of rotation, said taking unit being configured to obtain a plurality of image pick-up data corresponding to a plurality of partially overlapping images of various portions of an object picked up by the image pick-up apparatus, said plurality of image pick-up data including three-dimensional data and two-dimensional data of the object;

a calculating unit for calculating a position of the prescribed axis of rotation from at least some of said three-dimensional data of the plurality of image pick-up data; and

a processing unit for synthesizing at least some data selected from one of said two-dimensional data, said three-dimensional data, and both said two-dimensional data and said three-dimensional data, the processing unit using information of the calculated position of the prescribed axis of rotation to synthesize said at least some data.

8. The camera system according to claim 7, wherein

said image pick-up apparatus is positioned on the prescribed axis of rotation and is rotated while remaining positioned on the prescribed axis of rotation; and

the plurality of image pick-up data is obtainable as the image pick-up apparatus picks up images.

9. The camera system according to claim 7, wherein

said image pick-up apparatus is not positioned on the prescribed axis of rotation and is rotated between positions of equal distance from the prescribed axis of rotation; and

the plurality of image pick-up data is obtainable as the image pick-up apparatus picks up images.

10. The camera system according to claim 7, further comprising at least one additional image pick-up apparatus, wherein the plurality of partially overlapping images can be obtained by the image pick-up apparatuses.

11. The camera system according to claim 7, wherein the processing unit evaluates a relation based upon normals of overlapping portions of first and second three-dimensional data to synthesize said at least some data.

12. The camera system according to claim 11, wherein the overlapping portions of the first and second three-dimensional data are determined from corresponding first and second two-dimensional data.

13. The camera system according to claim 7, wherein said at least some data are subjected to coordinate transformation to a single coordinate system and are synthesized so that at least some of said partially overlapping images can be connected.

14. A camera system, comprising:

a taking unit comprising an image pick-up apparatus, said image pick-up apparatus being configured to rotate about a prescribed axis of rotation and being configured to pick up images as the image pick-up apparatus is rotated about the prescribed axis of rotation, said taking unit being configured to obtain a plurality of image pick-up data corresponding to a plurality of partially overlapping images of various portions of an object picked up by the image pick-up apparatus, said plurality of image pick-up data including three-dimensional data and two-dimensional data of the object, said plurality of image pick-up data being generated respectively by a plurality of image pick-up operations;

a calculating unit for calculating angles of rotation of the image pick-up apparatus relative to the prescribed axis of rotation while the plurality of image pick-up data are obtained, said calculating unit using at least some of said three-dimensional data of the plurality of image pick-up data to calculate said angles of rotation; and

a processing unit for synthesizing at least some data selected from one of said two-dimensional data, said three-dimensional data, and both said two-dimensional data and said three-dimensional data, the processing unit using information of the calculated position of the prescribed axis of rotation to synthesize said at least some data.

15. The camera system according to claim 14, wherein

said image pick-up apparatus is positioned on the prescribed axis of rotation and is rotated while remaining positioned on the prescribed axis of rotation; and

the plurality of image pick-up data is obtainable as the image pick-up apparatus picks up images.

16. The camera system according to claim 14, wherein

said image pick-up apparatus is not positioned on the prescribed axis of rotation and is rotated between positions of equal distance from the prescribed axis of rotation; and

the plurality of image pick-up data is obtainable as the image pick-up apparatus picks up images.

17. The camera system according to claim 14, further comprising at least one additional image pick-up apparatus, wherein the plurality of partially overlapping images can be obtained by the image pick-up apparatuses.

18. The camera system according to claim 14, wherein the processing unit evaluates a relation based upon normals of overlapping portions of first and second three-dimensional data to synthesize said at least some data.

19. The camera system according to claim 18, wherein the overlapping portions of the first and second three-dimensional data are determined from corresponding first and second two-dimensional data.

20. The camera system according to claim 14, wherein said at least some data are subjected to coordinate transformation to a single coordinate system and are synthesized so that at least some of said partially overlapping images can be connected.

21. A camera system, comprising:

a taking unit for obtaining a plurality of image pick-up data from images of a plurality of surface regions of an object obtained by an image pick-up apparatus while the object is rotated about a prescribed axis of rotation, said plurality of image pick-up data including three-dimensional and two-dimensional data of the object;

a calculating unit for calculating angles of rotation of the object relative to the prescribed axis of rotation while the plurality of image pick-up data are obtained, said calculating unit using at least some of said three-dimensional data of the plurality of image pick-up data to calculate said angles of rotation; and

a processing unit for synthesizing at least some data selected from one of said two-dimensional data, said three-dimensional data, and both said two-dimensional data and said

three-dimensional data, the processing unit using information of said angles of rotation to synthesize said at least some data.

22. The camera system according to claim 21, wherein the object is placed on a rotating stage rotating about the prescribed axis of rotation, and wherein the images of the plurality of surface regions of the object are obtained as the rotating stage is rotated.

23. The camera system according to claim 22, wherein
the rotating stage includes a plurality of planes oriented parallel to the prescribed axis of rotation;

each of the plurality of planes sequentially opposes the image pick-up apparatus as the rotating stage is rotated; and

the plurality of image pick-up data obtained respectively include image data of the plurality of planes.

24. The camera system according to claim 21, wherein said at least some data are subjected to coordinate transformation to a single coordinate system and are synthesized so that at least some of said partially overlapping images can be connected.

25. An image input system, comprising:
measuring means for measuring an object and for generating shape data of the object;
calculating means for calculating coordinate transformation information based upon a plurality of shape data obtained from different points of view of the object obtained by the measuring means; and
synthesizing means for synthesizing at least some of the plurality of shape data in accordance with the calculated coordinate transformation information.

26. An image input system according to claim 25, wherein the measuring means comprises a measuring unit that is positionable in different positions relative to an axis of

rotation and wherein said coordinate transformation information includes a position of the axis of rotation.